Title: Use of Electronic Personal Health Records as a health risk-reduction discussion tool (eSHINE Study)

Principal Investigator: Kevon-Mark Jackman, MPH, DrPHc

Morgan State University

Project Dates: March 31, 2014 – March 31, 2016

Federal Project Officer: Tamara Willis, PhD

Agency Support: Agency for Healthcare Quality & Research

Grant Award Number: Grant # R36HS023057

ABSTRACT

Purpose: The eSHINE Study is a two-phase sequential mixed-methods study among students at a historically Black university exploring perceptions on facilitating STD risk conversations with partners using electronic personal health records (PHRs).
Scope: Young Black adults continue to share a largely disproportionate burden of STD rates.
Methods: A Grounded Theory study on 35 students explored perceptions on incorporating PHRs into contextualized risk-discussion practices. An online survey instrument was developed to measure the distribution of and relationships between emergent themes and codes in a Cross-Sectional study on 354 students.
Results: PHRs were perceived to impact three aspects of risk discussions: (1) awareness and valuation, (2) ability, and (3) assurance. Approximately 62.8% of survey respondents reporting no risk discussion practices and 46.5% with inconsistent risk discussion practices believe PHR accessibility personally enables healthy risk communication practices with partners. Intentional beliefs for receiving electronic STD results (OR=14.7; $p<0.001$), beliefs that PHRs improve self-efficacy for facilitating initial and check-in discussions with partners (OR=2.33; 95% CI = 1.05, 5.14 and OR=4.00; 95% CI = 1.61, 9.94), and device memory space concerns (OR=0.41 95% CI = 0.21, 0.79) were significant predictors of perceived adoption of PHRs in discussion practices.
Conclusions: Findings suggest that young Black adults perceive PHRs as useful discussion tools and consider healthcare providers as a primary gateway for accessing comprehensive patient portal services. PHR awareness and access must be addressed in order to further explore its effectiveness in improving partner communication and disease prevention.

Key Words: PHRs, HIV/STD prevention, patient-portals, digital health tools

PURPOSE

The purpose of the Electronic Sexual Health Information Notification and Education (eSHINE) Study is to conduct an exploratory mixed-methods study, among students ages 18-25 years at a Historically Black College and University (HBCU), on perceptions of electronic personal health records (PHRs) as a tool for discussing sexually transmitted disease (STD) risk with partners – termed *dyadic PHR utility*.

The specific aims are to:

(1) Use a Grounded Theory study to gain contextual understandings of:
   a. how PHRs are perceived to influence the process of facilitating healthy conversations on STD testing between partners; and
   b. what factors influence decisions to adopt PHRs as a tool for risk discussions (i.e. dyadic PHR utility adoption).

(2) To develop an online survey instrument that measures the frequency of emergent qualitative perceptions and tests hypotheses emerging from the initial qualitative study.

(3) Use the new instrument to conduct a Cross-Sectional study:
   a. evaluating whether individuals with unhealthy risk discussion practices consider PHRs a tool to modify their behavior;
   b. evaluating predictors of perceived intentional decisions to adopt PHRs to receive STD test results and in discussions of STD risk with partners; and
   c. evaluating the prevalence of salient perceptions emerging from the Grounded Theory study.

The eSHINE Study provides new insight into the sexual health promoting potential of PHRs in a sub-population of young Black adults. Given the lack of research on PHR access and utility in young Black adults this study contributes to the growing field of research on sexual health digital interventions.

SCOPE

Sexually transmitted diseases (STDs), including HIV, affect approximately 110 million Americans at any point of time and have an annual healthcare cost of approximately $16 billion [Centers for Disease Control and Prevention (CDC), 2013]. Those at particularly high risk are young people ages 15 to 24 years (CDC, 2015a), particularly young Blacks. In 2010, young Black people comprised approximately 15.5% of the U.S. population ages 15-24 years but accounted for 50% to 70% of the major STDs, including infections with HIV, chlamydia, gonorrhea, and syphilis (CDC, 2012; CDC, 2011; U.S Census Bureau, 2012).

CDC recommends that sex partners talk about STD risk and prevention (CDC, 2014). Effective partner communication about STDs can reduce disease transmission by supporting testing, disease status disclosure, condom use, and the use of medicines to prevent and treat STDs (CDC, 2014). Nevertheless, many contextual factors, such as stigma, partner type, and self-efficacy, can present as effective barriers to partners facilitating healthy discussion events (Mutchler et al., 2008; Overstreet, Earnshaw, Kalichman, & Quinn, 2013; Sullivan et al., 2010).

Mobile technologies have demonstrated promise in aiding discussions between partners on STDs. Facebook was found to be useful in facilitating HIV discussions among Latino and African-American participants on topics such as: Prevention and Testing; Knowledge; Stigma; and Advocacy (Young & Jaganath, 2013). In addition to communication, mobile health

technologies have been effective in improving knowledge, testing, condom use, and care management related to sexual health (*Khan et al., 2010;* McInnes, et al., 2011; Guse et al., 2012). Recent studies have demonstrated that high-risk populations such as men who have sex with men (MSM) desire comprehensive mobile health tools capable of providing an array of services tailored to meet the need of an individual user are strongly desired in this population – including access to test results (Muessig et al., 2013; Goldenberg et al., 2014). In contrast, earlier studies examining preferences for delivery of STD results show that patients preferred to receive results in person from a healthcare professional rather than via SMS text messaging (Brown, L., Copas, A., Stephenson, J., Gilleran, G., Ross, J.D., 2008; Brugha, R., et al., 2011). Today's patient portal technologies are more advanced and interactive than SMS text messaging. Nevertheless, these studies demonstrate that patient attitudes on mobile health technology may evolve over time.

The National HIV Strategy for the United States: Updated to 2020 calls for federal agencies to encourage the development and implementation of emerging digital health tools and technologies to improve outcomes at all points along the continuum of care (White House, 2015). PHRs, sometimes referred to as patient portals, are mobile and web-based products that allow individuals to securely access health records and manage medical care using digital media devices such as computers, smart phones and tablets. PHR systems that allow patients to have direct access to much of their clinical data, including such items as diagnoses, procedures, allergies, medications, surgeries, lab results, and other data and to manage on-line activities such as, scheduling visits and ordering prescriptions, are referred to as "tethered" PHRs – since it is limited to a single health system (ONC, 2015). PHR services are capable of enabling individuals to remotely retrieve sexual health records, such as their STD test dates, laboratories, diagnoses, prescriptions and educational resources – information pertinent to risk discussion events. Delivering timely electronic access to personal health information is Meaningful Use Objective 8 in the Centers for Medicare and Medicaid Services (CMS), Medicaid EHR Incentive program (CMS, 2015). Healthcare providers are encouraged to provide patients with access to their health information. In fact, since 2011 the program has paid out over $10 billion to eligible professionals and hospitals for demonstrating adoption, implementation, upgrading, or meaningful use of certified EHR technology (CMS, 2016).

While research on mobile health interventions continues to burgeon, there is a lack of research available on tethered PHR applications and STD prevention. Furthermore, there is a lack of studies on the awareness, attitudes, and accessibility to PHRs among young Black adult populations. Utilization of electronic STD results delivery among young Black adults is also not well known. On the other hand, it is well known that young Black adults have comparable rates of accessibility to smart phones as their White counterparts - an estimated 85% of Blacks ages 18-29 compared to 79% of Whites own a smart phone (Pew Research Center, 2014). With PHR vehicles in hand, young Black adults may incorporate this technology into interpersonal and otherwise social situations such as sexual encounters. Yet, little is known about young Black adult perceptions of PHRs as a STD discussion tool.

Therefore, the eSHINE Study examines perceptions of PHRs as a STD discussion tool in a sample of young Black adults ages 18-25 years enrolled at a HBCU in Baltimore, MD. Maryland's Baltimore-Columbia-Towson statistical area ranks 10th in the nation for new diagnoses of HIV and AIDS (CDC, 2015b).

METHODS

Phase 1 – Grounded Theory Study

There is no prior guidance for understanding the impact of PHRs on facilitating risk discussion events or on the characteristics of likely adopters of the technology in risk discussions with partners in young Black adult populations. Due to the lack of prior studies on the role of PHRs in risk discussions, no assumptions were made about participant perceptions nor awareness of PHR services. Therefore, an exploratory mixed-methods research design was selected to determine what constructs are important to study in relation to these topics. The study design consisted of an initial Grounded Theory study (Phase 1), an intermediate instrument development phase, and a Cross-Sectional study (Phase 2) using the instrument developed from Phase 1 findings (Figure 1). Constructs from Fishbein & Ajzen's Integrative Model of Behavioral Prediction (2010), Roger's Diffusion of Innovations Theory (2003), and Chaudoir, Fisher, and Simoni's Disclosure Processes Model (2011) provided a framework that guided the qualitative exploration.

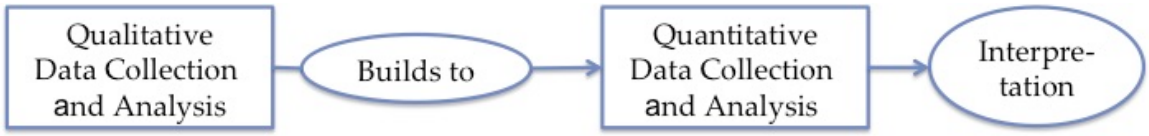

Figure 1 – *The Exploratory Sequential Design (Creswell, 2011).*

The initial Grounded Theory study utilized focus group and individual in-depth interview data sources to inductively derive conclusions about the incorporation of PHRs into facilitating risk discussion events. Focus group and interview sessions were conducted in private conference rooms located on university campus and were moderated by the principal investigator. Participants received $25.00 for each session attended and were entered to win raffle prizes. Informed consent was obtained prior to data collection.

Participants were invited to participate in an individual in-depth interview at the conclusion of each focus group session. Audio transcripts of each focus group session were reviewed and field notes completed prior to conducting individual interviews. No more than two interview sessions occurred before a similar analysis of audio transcripts and field notes. Subsequent focus groups were conducted after individual in-depth interviews were completed on participants from the previous focus group. Two participants were interviewed without participating in a focus group (one male and one female) to further explore emergent codes within themes. Systematic data collection and analysis occurred as simultaneous and evolving processes.

Individual interviews were used to provide a deeper exploration of focus group commentary in a setting outside the social influence of peers. Sessions revisited focus group topics and themes, however interviewees were asked more direct and in depth questions related to their perspectives and experiences. During in-depth interviews participants completed a short questionnaire to collect information empirically relevant to sexual risk discussions and the adoption of new technology (i.e. demographic information, sexual risk behaviors, and history of STD diagnoses).

A total of 35 students participated in three focus groups and eighteen individual in-depth interviews in May – July 2014. Driven by both purposeful and theoretical sampling Phase 1

participants consisted of a heterogeneous sample of students, including students identifying as gay, heterosexual, student athletes, and Greek-lettered organizations. Session recordings were transcribed and uploaded to ATLAS.ti software along with field notes for explorative analyses. Descriptive statistics for Phase 1 participants are found in Table 1.

Table 1
Descriptive statistics for eSHINE Study Phase 1 participants (n = 35)

Variables	Men n (%)	Women n (%)	Total n (%)
Focus Group Totals *(n=33)*			
Focus Group 1	4 (67.7)	2 (33.3)	6 (100)
Focus Group 2	4 (40.0)	6 (60.0)	10 (100)
Focus Group 3	10 (58.8)	7 (41.2)	17 (100)
Interview Participants Demographics *(n=18)*			
Median age (IQR)	20 (19-22)	20 (19-21)	20 (19-21)
Sexual orientation			
Heterosexual	7 (70.0)	8 (100.0)	15 (83.3)
Gay/Bisexual	3 (30.0)	0 (0.0)	3 (16.7)
Partners w/in past 9 months			
1	2 (20.0)	6 (75.0)	8 (44.4)
2	3 (30.0)	1 (12.5)	4 (22.2)
3-4	4 (40.0)	1 (12.5)	5 (27.8)
25+	1 (10.0)	0 (0.00)	1 (5.6)
Inconsistent Condom Use			
Yes	5 (50.0)	6 (75.0)	11 (61.1)
No	5 (50.0)	2 (25.0)	7 (38.9)
Drug/Alcohol Use During Sex			
Yes	7 (70.0)	6 (75.0)	13 (72.2)
No	3 (30.0)	2 (25.0)	5 (27.8)
Concurrency among recent partners			
Yes	3 (30.0)	2 (25.0)	5 (27.8)
No	7 (70.0)	6 (75.0)	13 (72.2)
STD screening history			
Never	3 (30.0)	0 (0.0)	3 (16.7)
Less than 12 months	4 (40.0)	5 (62.5)	9 (50.0)
12 months or more	3 (30.0)	3 (37.5)	6 (33.3)
Prior STD Diagnosis			
Yes	0 (0.00)	3(37.5)	3 (16.7)
No	10 (100.0)	5(62.5)	15 (83.3)
Smart phone ownership (yes)	9 (90.0)	8(100.0)	17 (94.7)

Ten themes emerged from the Grounded Theory analysis; a table of themes and codes are located in Table 2. In addition, two models emerged from this initial study and are described in brief below:

Emergent Model 1 - PHRs Impact on Facilitating Risk Discussion

PHRs are perceived to impact three aspects of risk discussions: 1. *Awareness & Valuation*: Being aware that risk discussions can reduce disease transmission, furthermore, knowing what questions to ask and topics for discussion indicative of good sexual health; 2. *Ability* (personal agency): Being able to engage or participate in healthy risk discussions with a partner; including being able to overcome barriers that may inhibit discussions; and 3. *Assurance*: Being assured that information exchanges between partners are accurate. These impacts are believed to increase facilitation of risk discussion events by reducing barriers.

This model provides insight into perceptions of PHRs as a tool to increase healthy discussions on STD risk. It is the foundation for the hypothesis that individuals with unhealthy practices perceive PHRs as a tool that will modify their discussion practices.

Emergent Model 2 - Likely Adopters of PHRs as a Discussion Tool

Perceived intentions to use PHRs in STD risk discussions with partners is influenced by (1) perceived intentions to use PHRs for receiving STD test results, (2) risk discussion practices and valuation, and, (3) perceptions about using PHRs for discussing risk between dyads. Where intentional beliefs on receiving STD results electronically is influenced by (1) Perceptions about PHR risks and benefits (2) willingness to pay for PHR services and (3) prior knowledge of PHR services. This model gives insight to characteristics of likely early adopters of PHRs as a STD discussion tool.

Intermediate Phase – Instrument Development.

The Grounded Theory study generated a rich and contextual understanding of perceptions on PHRs among a sample of young Black adults. However, its sample size of 35 participants presents major limitations to the generalizability of findings. The Phase 2 Cross-Sectional Study addresses this issue by deductively testing Phase 1 conclusions.

An instrument was developed to measure the cross-sectional prevalence of several emergent attitudes, normative beliefs, and personal agency beliefs, along with relationships to perceived likely adoption of PHR use. The instrument was also designed to answer research questions related to the two models from Phase 1: (1) Do individuals with unhealthy risk discussion practices believe that PHRs will modify their behavior?; and (2) What are predictors of decisions to adopt PHRs to receive STD test results and to discuss STD risk with partners? Perceptions (i.e. attitudes, beliefs, self-efficacy, etc.) were measured using seven-point Likert scale items (Glanz, 2008, p 72-75).

Phase 2 - Cross-Sectional Study

The eSHINE Study Online Survey is Cross-Sectional study conducted with Morgan State University students January-May 2015. Informed consent was obtained from participants physically during field-recruitment and electronically using DocuSign as part of the study registration process. Participants received $20.00 for completing the survey and were entered to win raffle prizes. To protect identity, participants used a unique survey completion code to collect incentives.

The survey was individually disseminated to registered participants using Qualtrics software. Survey items used short phrases and incorporated terminology quoted during focus groups and interviews. In order to complete the survey, participants were required to demonstrate an understanding of study terminology by answering three items related to: (1) PHRs; (2) main, casual, and hook-up sexual partners; and (3) risk discussions. Two trigger questions were placed in the middle and end of the survey to verify that participants were properly reading questions. The survey was pilot-tested on eight MSU students and revisions made based upon participant feedback and researcher observations. A final questionnaire consisted of 123 items and a completion burden of approximately 30-45 minutes.

Table 2
eSHINE Study Phase 1: Summary of findings on exploring perceptions of dyadic PHR-utility

Session Topic	Themes	Codes		
		Likely Adoption	**Likely Rejection**	**Adopt & Reject Overlap**
I.	•Occurrence of risk discussions •Barriers to risk discussion events	•Important to ask •Demonstrates responsibility •Self-efficacy to facilitate risk discussions •Likely to ask partners about screening	•Not important •Meaningless practice (other prevention methods employed i.e. condom-use; utilize perceptions on partner risk)	•Awkward •Kills the mood •People may lie •Right to ask
II.	•Relative advantages to using STD PHRs •Risks to using STD PHRs	•Convenient record management •Will utilize if accessible •Promotes health awareness •Encourages personal health agency •Will pay for services •Incorporate relevant health resources into PHR services (i.e. sexual health counseling)	•Weakens doctor-patient relationship •Privacy barrier • Skeptical of data integrity	•Innovative •Resourceful
III.	•Impact of PHRs on risk discussion occurrence •Impact of dyadic PHR utility on risk discussion barriers • Dyadic PHR utility benefits to partner communication • Dyadic PHR utility threats to partner communication •Impact of dyadic PHR utility on risk behaviors • Dyadic PHR utility adopt / reject decisions	•Convenient for risk discussions •Eases tension / comfort •Helps facilitation •Builds trust •Compatible / beneficial to MSM community •Doctors and peers likely to influence decisions to adopt dyadic PHR utility	•Implies partner distrust / offensive •Intrusive •Unimportant in trusting relationships	•Information verification •Increases discussions •False sense of security •More commonly practiced in future

Note: PHR - electronic personal health record

The eSHINE Study Online Survey was reviewed and approved by the MSU institutional Review Board. A total of 380 students submitted a survey; incomplete surveys were excluded from analysis giving a final sample of 354 students. Descriptive Statistics of Phase 2 participants are found in Table 3.

Analysis

For research question 1, cross tabulations were performed to obtain the proportion of participants with unhealthy risk discussion practices that believed PHRs would improve their risk discussion practice. Logistic regression was performed to obtain the odds of participants with unhealthy practices believing that PHRs could effectively modify their behavior.

For research question 2, exploratory logistic regression analyses were conducted for selecting predictors of perceived dyadic PHR-utility adoption. The initial model contained a large amount of variables derived from qualitative codes related either to: (1) risk discussion practices and perceptions, (2) perceptions of individual STD PHR-utility, or (3) perceptions of dyadic PHR-utility (qualitative session topics) as potential predictors of dyadic PHR-utility adoption. A stepwise logistic regression procedure was conducted to reduce the initial model and obtain a model best predicting dyadic PHR-utility intentions using STATA Statistical Software: Release 14.

Cross-tabulations were performed for each of the variables to obtain bivariate relationships between (independent) predictor variables kept in the model and dyadic PHR-utility intentions. Chi-squares and p-values at levels $p < 0.05$ were used to measure whether bivariate associations were significant. Model 1 of the logistic regression analyses on intentions for individual and dyadic PHR utility was performed for each PHR utility predictors kept in the Stepwise Logistical Procedures. Model 2 adjusts for age, gender, self-reported STD diagnosis history, in addition to all variables kept in Stepwise Logistical Procedures. Model 2 was found favorable since it included contextual variables from qualitative topics.

Limitations

There are many limitations to this mixed-methods study. Results may not be generalizable to other young Black adult populations given the HBCU study setting and convenience sampling. Additionally, data analyses were conducted using self-reported data and may be subjected to biases (e.g. recall bias) or erroneous data. Resources were not available in this study for additional researcher assistants– thus, qualitative analyses lack inter-coder reliability. It is also important to note that instrument development rigor did not include formal statistical analyses for reliability and validity. Survey development was driven and grounded in the theory development (rather than instrument development). The goal of this project was to explore how a sample of young Black adults will interact with PHRs in a dyadic context and not to develop a standardized scale for measuring perceptions on a phenomenon yet to be lived or experienced by most participants. Future research is highly dependent of policies and programs that promote equity of patient electronic access to STD test results in young Black populations.

Table 3

Descriptive statistics for eSHINE Study Phase 2 participants (n = 354)

Variables	Men	Women	Total
	***n* (%)**	***n* (%)**	***n* (%)**
Age			
18-19	72 (43.1)	59 (31.5)	131 (37.0)
20-21	53 (31.7)	78 (41.7)	131 (37.0)
22-23	32 (19.2)	41 (21.9)	73 (20.6)
24-25	10 (6.0)	9 (4.8)	19 (5.37)
Race			
African-American/Black	161 (96.4)	182 (97.3)	343 (96.9)
Other	6 (3.6)	5 (2.7)	11 (3.1)
Sex Partners in Past 12 Months			
0-1	55 (32.9)	77 (41.2)	132 (37.3)
2-5	74 (44.3)	83 (44.4)	157 (44.3)
6+	14 (8.4)	11 (5.9)	25 (7.1)
No prior sex	24 (14.4)	16 (8.6)	40 (11.3)
STD Screening			
Never tested	51 (30.5)	29 (15.5)	80 (22.6)
0-7 months	53 (31.7)	100 (53.5)	153 (43.2)
8+ months	39 (23.3)	42 (22.5)	81 (22.9)
No prior sex	24 (14.4)	16 (8.6)	40 (11.3)
Recent partner types*			
Main	84 (50.3)	129 (69.0)	213 (60.2)
Casual	77 (46.1)	76 (40.6)	153 (43.2)
Hook-up	47 (28.1)	25 (13.4)	72 (20.3)
Sex while intoxicated within 12 months			
Yes	65 (38.9)	107 (57.2)	172 (48.6)
No	102 (61.1)	80 (42.8)	182 (51.4)
Unprotected sex with casual partner within 12 months			
Yes	44 (26.4)	65 (34.8)	109 (30.8)
No	123 (73.6)	122 (65.2)	245 (69.2)
Unprotected sex with hook-up partner within 12 months			
Yes	12 (7.2)	14 (7.5)	26 (7.3)
No	155 (92.8)	173 (92.5)	328 (92.7)
Concurrent partnerships within 12 months			
Yes	38 (22.7)	30 (16.0)	68 (19.2)
No	129 (77.3)	157 (84.0)	286 (80.8)
Prior STD Diagnosis			
Yes	14 (8.4)	45 (24.1)	59 (16.7)
No	78 (46.7)	97 (51.9)	175 (49.4)
No prior sex or no history of testing	75 (44.9)	45 (24.1)	120 (33.9)

Note. *Partner type categories are not mutually exclusive

RESULTS

For the purposes of this report, results of the Grounded Theory and Cross-Sectional studies are combined. Percentages, chi-square statistics, and odds ratios all refer only to quantitative study results. In addition, due to limitations in document length – some findings may not be accompanied with a table or graphic.

Contextual pathways initiating and maintaining sexualized dyadic relationships were commonly the basis for risk discussion perceptions and practices. Dyadic dynamics between partners ranged from solely pleasure seeking sex and non-committal to socio/emotional

interdependent and committed. Partner-types were classified as; (1) main partners (partnerships that are intended to be exclusive relationships) and (2) casual partners [includes one-night-stands (i.e. partnerships not intended to be exclusive relationships)]. Trust and rapport between casual partner types varied greatly by relationship characteristics, i.e. dyads with previous long-term friendship, recently acquainted dyads, etc.

Over three quarters (88.1%) of participants consider discussions with partners about STD risk as important practices (Table 4). However, 37.8% of participants reported recent encounters with new partners where STD testing was not discussed prior to sex. Discussions on STD testing with partners prior to sex were omitted due to barriers such as: (1) Beliefs that discussions would be awkward (28.3%), (2) Beliefs that people could lie either way (33.3%), (3) Use of condoms (44.6%) and (4) The topic never came to mind (31.6%).

Almost two-thirds (63.8%) of participants perceived themselves as likely to solicit screening information from partners at some point in time. Approximately 40.4% of the sample reported consistently discussing STD risk with partners prior to sex, while 41.0% reported inconsistent practices of discussion either before or after sex and 14.4% reported never discussing STD risk with partners. With PHRs accessible, approximately 61.0% of participants believed they would consistently discuss risk with partners prior to sex; 30.8% believed that they would inconsistently discuss risk before or after sex and 4.2% believed they would not discuss risk their partners (Table 4).

Table 4
Risk discussion beliefs and practices among eSHINE Study Phase 2 participants

	Men	**Women**	**Total**
Variables	***n* (%)**	***n* (%)**	***n* (%)**
Valuation of Discussing STD Risk with Partners			
Important	137 (82.0)	175 (93.6)	312 (88.1)
Unimportant/Unsure	30 (18.0)	12 (6.4)	42 (11.9)
Perceived as likely to solicit partner screening history			
Yes	93 (55.7)	133 (71.1)	226 (63.8)
No/Unsure	74 (44.3)	54 (28.9)	128 (36.2)
Did not discuss STD testing with recent new partner			
Yes	62 (37.1)	72 (38.5)	134 (37.8)
No	71 (42.5)	93 (49.7)	164 (46.4)
No prior sex or no sex in more than 12 months	34 (20.4)	22 (11.8)	56 (15.8)
Barriers resulting in skipped risk discussion in past 12 months*			
Belief that discussion would be awkward	47 (28.1)	53 (28.3)	100 (28.3)
Belief that people can lie either way	54 (32.3)	64 (34.2)	118 (33.3)
Use of condoms	86 (51.5)	72 (38.5)	158 (44.6)
Thought to discuss risk never came to mind	58 (34.7)	54 (28.9)	112 (31.6)
Perceived risk discussion timing practices w/out PHRs			
Before sex	68 (40.7)	75 (40.1)	143 (40.4)
After sex	6 (3.59)	9 (4.81)	15 (4.24)
Before and/or after sex	64 (38.3)	81 (43.3)	145 (41.0)
Never	29 (17.4)	22 (11.8)	51 (14.4)
Perceived Risk Discussion Timing Practices w/ PHRs			
Before sex	100 (59.9)	116 (62.1)	216 (61.0)
After sex	10 (5.99)	4 (2.14)	14 (3.95)
Before and/or after sex	51 (30.5)	58 (31.0)	109 (30.8)
Never	6 (3.59)	9 (4.81)	15 (4.24)

Note. *Risk discussion barriers are not mutually exclusive

With PHRs accessible, the proportion of participants believing they would consistently discuss STD risk with partners prior to sex increased by 20.6%. More specifically, 62.8% of individuals reporting no discussion practices and 46.5% with inconsistent risk discussion practices believed PHRs would healthfully modify their practices. In the adjust logistic regression model adjusted for age and gender, participants reporting complete omission of risk discussions over four times the odds of believing PHRs enable them to consistently discuss risk with partners prior to sex compared to their timing without PHRs (OR = 4.21; 95% CI =1.11, 15.9). Participants reporting inconsistent risk discussion practices had more than twice the odds (OR = 2.52 odds; 95% CI = 0.75, 8.44) of believing that PHR accessibility will allow them to consistently discuss risk with partners prior to sex compared to their discussion timing without PHRs, however this was not significant (Table 5).

Table 5

Logistic Regression for perceived risk discussion timing with PHRs among eSHINE Study Phase 2 participants (n = 200)

	Model 1 (Unadjusted)		Model 2 (Adjusted)	
Covariates	OR	95% CI	OR	95% CI
Gender				
Female	1.01	0.57, 1.74	1.07	0.77, 8.53
Age				
18-19 (ref.)	1.00	--	1.00	--
20-21	1.04	0.59, 1.86	1.21	0.63, 2.35
22-23	1.36	0.68, 2.71	1.65	0.75, 3.63
24-25	1.21	0.36, 4.11	1.58	0.43, 5.76
Perceived risk discussion timing without PHRs				
Never	1.94	0.97, 3.88	4.21*	1.11, 15.9
Either before / after sex	0.82	0.45, 1.52	2.52	0.75, 8.44

Note. ref. stands for reference category.
Significance: * $p<0.05$; ** $p<0.01$; *** $p<0.001$

Most participants believed that PHRs make it easier to initiate risk discussions with new partners and facilitate "check-in" conversations with prior partners (73.5% and 79.1%, respectively). An even larger majority of participants (81.4%) believed that dyadic PHR utility would increase their confidence in testing information disclosed by partners (Table 6). More specifically, 83.1% of participants that skipped a recent risk discussion event due to normative beliefs that partners could lie reported that PHRs would increase their assurance in disclosed in information (table not listed).

Support for receiving electronic STD results was much greater than opposition. Approximately 57.6% of participants believe they would likely adopt receiving electronic results compared to 15.3% of likely rejecters (Figure 2). Over a quarter of participants (27.1%) of the sample were unsure about decisions to utilize electronic delivery of STD results if offered. Similarly, a much greater proportion of participants support dyadic PHR utility compared to participants in opposition (58.8% vs. 11.3%); 29.9% of participants were unsure about dyadic PHR utility (Figure 2). Despite being unsure about individual and dyadic use of electronic STD records, an overwhelming majority of participants believe that healthcare providers should offer PHR access to patients [91.8% (Table 6)].

Table 6

Perceptions on individual and dyadic PHR utility among eSHINE Study Phase 2 participants (n = 354)

Variables	Men *n* (%)	Women *n* (%)	Total *n* (%)
Would utilize STD PHRs if offered			
Yes	101 (60.5)	103 (55.1)	204 (57.6)
No/Unsure	66 (39.5)	84 (44.9)	150 (42.4)
Intentions for dyadic PHR utility			
Agree	103 (61.7)	105 (56.2)	208 (58.8)
Disagree/Unsure	64 (38.3)	82 (43.8)	146 (41.2)
Device memory space perceived as utility barrier			
Yes	64 (38.3)	88 (47.1)	152 (42.9)
No	103 (61.7)	99 (52.9)	202 (57.1)
Willing to pay for PHR services			
Yes	57 (34.1)	43 (23.0)	100 (28.2)
No	110 (65.9)	144 (77.0)	254 (71.8)
Helpful to partner communication			
Agree	137 (82.0)	159 (85.0)	296 (83.6)
Disagree/Unsure	30 (18.0)	28 (15.0)	58 (16.4)
Eases facilitation of risk discussions with new partners			
Agree	129 (77.3)	131 (70.1)	260 (73.5)
Disagree/Unsure	38 (22.7)	56 (29.9)	94 (26.5)
Improves assurance in exchanged testing info			
Agree	102 (69.9)	186 (89.4)	288 (81.4)
Disagree/Unsure	44 (30.1)	22 (10.6)	66 (18.6)
Eases facilitation of "check-in" risk discussions with previous partners			
Agree	132 (79.0)	148 (79.1)	280 (79.1)
Disagree/Unsure	35 (21.0)	39 (20.9)	74 (20.9)
Builds trust between partners			
Agree	138 (82.6)	155 (82.9)	293 (82.8)
Disagree/Unsure	29 (17.4)	32 (17.1)	61 (17.2)
Better option for facilitating risk discussions			
Agree	111 (66.5)	69 (63.1)	229 (64.7)
Disagree/Unsure	56 (33.5)	69 (36.9)	125 (35.3)

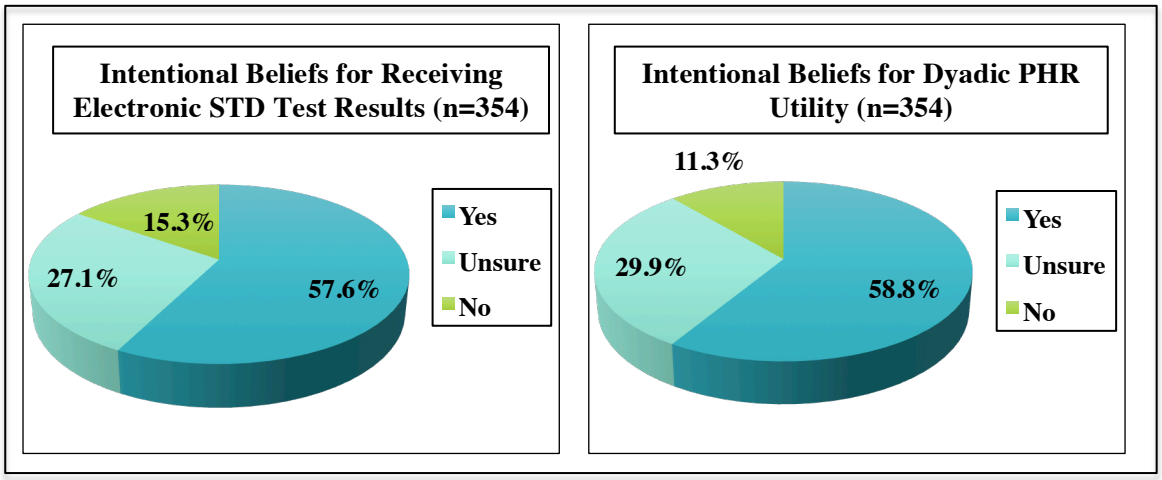

Figure 2 – *Intentional beliefs for receiving electronic STD test results (left) and intentional beliefs for practicing dyadic PHR utility (right) among eSHINE Study Phase 2 participants.*

Likely adoption of dyadic PHR utility is significantly associated with intentions to receive electronic STD results and four innovation attributes related to, perceived relative advantages, trialability, and compatibility (Table 7). Participants with individual STD PHR utility intentions had the greatest odds of dyadic PHR utility intentions (OR = 8.98; 95% CI = 4.56, 17.7). Belief that PHRs make it easier to initiate risk discussions with new partners is associated with dyadic PHR intentions (OR = 2.33; 95% CI = 1.05, 5.14). Similarly, belief that PHRs make it easier to facilitate "check-in" risk discussions with prior partners was more strongly associated with dyadic PHR-utility intentions (OR = 4.00; 95% CI = 1.61, 9.94). Participants identifying device memory space as a barrier to STD PHR utility had less odds of dyadic PHR utility intentions (OR = 0.41; 95% CI = 0.21, 0.79).

Table 7

Unadjusted and adjusted logistic regression analyses of dyadic PHR utility predictors among eSHINE Study Phase 2 participants (n = 304)

	Model 1 (Unadjusted) n=354		Model 2 (Adjusted) n=304	
Covariates	OR	95% CI	OR	95% CI
Gender				
Female	0.79	0.52, 1.22	0.72	0.37, 1.41
Age				
18-19 (ref.)	1.00	--	1.00	--
20-21	0.82	0.53, 1.27	0.61	0.28, 1.32
22-23	1.16	0.69, 1.97	0.85	0.34, 2.15
24-25	2.03	0.72, 5.78	0.47	0.12, 1.80
Dyadic PHR utility predictors				
History of STD diagnosis	2.12*	1.14, 3.93	2.21	0.90, 5.43
Intends to receive STD PHRs	14.7***	8.76, 24.8	8.98***	4.56, 17.7
Improves partner communication	4.85***	2.60, 9.04	2.47	0.85, 7.21
Easier risk discussion facilitation (new partners)	6.56***	3.86, 11.1	2.33*	1.05, 5.14
Better option for facilitating risk discussions	4.92***	3.08, 7.85	1.74	0.85, 3.54
Likely to solicit partner screening information	1.69**	1.07, 2.59	1.84	0.92, 3.68
Easier "check-in" discussion facilitation (previous partners)	7.91***	4.30, 14.5	4.00**	1.61, 9.94
Willing to pay for PHR services	3.38***	1.98, 5.76	2.15	0.99, 4.68
Memory space perceived as a utility barrier	0.19***	0.12, 0.30	0.41**	0.21, 0.79
PHRs improves confidence in exchanged risk information	3.64***	2.07, 6.42	0.44	0.15, 1.29

Note. ref. stands for reference category.
Significance: * $p<0.05$; ** $p<0.01$; *** $p<0.001$

Despite the multitude of contextual factors that shape risk discussion occurrence between dyads, the majority of participants held favorable beliefs about dyadic PHR utility improving risk discussion comfort, improving communication, building dyadic trust, etc. Significant differences in perceptions about dyadic PHR utility exist between likely adopter and rejecters. PHRs were believed to improve the comfort of risk discussion events by 81.7% of likely adopters compared to 41.1% of likely rejecters ($\chi^2 = 62.24$; $p < 0.001$). Belief that PHRs are beneficial to partner communication were held by 92.3% of adopters and 71.2% of rejecters ($\chi^2 = 27.80$; $p < 0.001$). Approximately 91.3% of likely adopters and 70.5% of likely rejecters believe that dyadic PHR utility builds trust between partners, ($\chi^2 = 26.02$ $p < 0.001$). Nevertheless, 69.9% of likely dyadic PHR utility rejecters and 56.7% of likely adopters believe that soliciting may be awkward ($\chi^2 = 6.29$; $p = 0.012$) (table not listed).

Participants self-disclosing a history of infection were strongly supportive of using PHRs to facilitate discussions in the qualitative study. Individuals self-reporting a history of infection in the cross-sectional study had more than twice the odds of being likely adopters of dyadic PHR utility – adjusted for age and gender (Table 7). Participants reporting STD screenings within the past year have more than twice the odds of being likely dyadic PHR utility adopters [OR = 2.03; 95% CI = 1.26, 3.31; $p = 0.004$ (table not listed)].

Phase 1 participants describing perceptions rejecting dyadic PHR utility often expressed normative perceptions that partner distrust is believed to serve as a primary motivation for dyadic PHR utility. These beliefs were not associated with dyadic PHR utility intentions in the cross-sectional analysis (table not listed). Approximately 33.6% of likely dyadic PHR adopters believe their dyadic PHR utility will be motivated by partner distrust. Although, one-third of likely adopters may be motivated by partner distrust to solicit electronic STD results, less than 15.0% of these participants view being perceived by a partner as distrusting a barrier to PHR solicitation. On the other hand, 52.3% agree that dyadic PHR utility may be moot for trusting relationships (table not listed).

Perceived difficulty in sharing positive electronic results (74.3%) was a more salient consideration for likely rejecters of dyadic PHR utility. Approximately, 81.5% of likely rejecters compared to 69.2% of adopters believe that sharing positive electronic STD results will be a difficult task ($\chi^2 = 6.77$; $p = 0.009$). There was also a significant association between this belief and gender. Approximately 79.1% of women compared to 68.9% of men believe that it would be difficult to share a positive PHR ($\chi^2 = 4.88$; $p = 0.027$). Approximately 80.8% of likely adopters compared to 48.0% of likely rejecters believe PHRs may be beneficial to risk communication with potential partners for positive individuals ($\chi^2 = 41.95$; $p < 0.001$).

In addition to individual-level factors, interpersonal and socio-environmental factors are also associated with likely adoption of PHRs. As purported by DOI, communication channels for an innovation affects decisions for adoption. Interpersonal communication channels were more largely believed to influence decisions to adopt dyadic PHR utility compared to mass media channels. For example, participants identified messages from, doctors (86.1%), sex partners (68.3%), family (58.6%), peers (47.7%), online information (27.7%), and media ads (23.7%), to affect adoption decisions (table not listed). In bivariate analyses on likely communication channels for dyadic PHR utility, both common and disparate perceptions were held between likely adopters and rejecters. Family and sex partner communication channels were not significantly associated with dyadic PHR utility adoption in chi-squared analyses. Approximately 86.1% of likely adopters and 74.7% of likely rejecters believe doctors will influence decisions to practice PHR facilitated risk discussions ($\chi^2 = 7.35$; $p = 0.007$). Just over half, (53.8%) of adopters and 39.0% of rejecters believe that peers will influence dyadic PHR discussion decisions ($\chi^2 = 7.54$; $p = 0.006$). Few participants considered media outlets as communication channels for dyadic PHR utility; 29.8% of adopters and 15.1% of rejecters ($\chi^2 = 10.30$; $p < 0.001$) (table not listed).

Belief that dyadic PHR utility motivates increased STD screening practices was a highly salient perception in the qualitative study. However, this appears to be the least salient influence of dyadic PHRs on risk behaviors. Approximately 56.5% of participants believed their screening practices would increase as a result of PHR accessibility. Additionally, 85.6% of participants believe they are unlikely to have sex with someone unwilling to share a PHR. Participants in the qualitative study raised concerns that sharing negative electronic STD records may lead to a "false sense of confidence" to have unprotected sex. Approximately, 30.8% of likely dyadic PHR

utility adopters believe they would not use condoms when sharing disease-free electronic results [$\chi^2 = 4.59$; $p = 0.032$ (table not listed)].

Electronic health services awareness and adoption

In a cross tabulation of health seeking behavior and prior PHR knowledge, 71.5% of participants reporting a visit to a primary care physician had no prior knowledge of PHR services. Most participants consider PHRs a convenient tool for health management (88.2%) and helpful to the doctor-patient relationship (74.1%). Providing comprehensive sexual health services beyond electronic laboratory test results is additionally important to the study population. Services like counseling for positive individuals, reproductive health services for women, and information on STDs (i.e. prevention, transmission and treatment) were described as important components of electronic healthcare services in qualitative sessions. In the Cross-Sectional study, participants reported beliefs that services such as, educational resources (85.3%), counsel and resources for STD positive individuals (83.9%), sexual health management tools (85.6%), and a test site locator (86.8%) are important components to include in PHR products. Finally, 78.8% of participants believe PHRs should contain their complete health record (table not listed).

Breach to personal privacy was a salient discussion topic in qualitative sessions; both for participants identifying as likely adopters as well as likely rejecters of PHR utility. Although, 81.9% of participants identified privacy concerns as a barrier to PHR utility, privacy concerns was not a significant predictor of dyadic PHR utility intentions in multivariate analyses (table not listed). These findings suggest that even though threats to privacy breach are ever present, these risks are negotiated with innovation benefits (e.g. convenience) in decisions to adopt.

A stepwise regression procedure was conducted on predictors of PHR utility using PHR perceptions and health-seeking behaviors as predictor variables. Willingness to pay and belief that PHRs improve the doctor-patient relationship significantly increased odds of PHR utility [(OR = 3.07; 95% CI = 1.42, 6.66) and (OR = 2.99; 95% CI = 1.46, 6.15)]. While concerns about PHR price significantly lower odds of PHR adoption for receiving STD results [OR = 0.22; 95%; CI = 0.11, 0.44 (table not listed)].

Discussion and Conclusions

One of the most significant findings of this study is that participants with unhealthy practices – primarily those who never practice risk discussions - believe that conversations with partners about risk and testing would consistently occur before sex with PHRs. Talking with sex partners about STDs and staying safe before having sex is an effective prevention strategy. The eSHINE Study presents a starting point for understanding how to build the capacity of tethered STD PHRs as new discussion tools in a young Black adult population. We now know that young Black adults will support accessing their electronic STD results and using records in discussions with partners. We also know that almost a third of participants are not yet ready to decide whether they are likely adopters or rejecters of dyadic PHR-utility.

As entities aim to meet program objectives to provide timely patient electronic access to personal health information (i.e. laboratory results) – attention to healthcare equity is required. The prevalence of PHR unawareness among young Black individuals who have recently accessed healthcare services is concerning and indicates that healthcare professionals may not be offering PHR services to this demographic.

We now know the belief that PHRs will make talking with partners about risk easier is the most salient perceived relative advantage in people that are more likely to use PHRs with partners. In addition, PHRs need to be included as a part of healthcare services, requiring no additional out-of-pocket costs. Individuals who are interested in PHR utility are less likely to access these services if there are addition out-of-pocket costs. Similarly, STD PHRs will compete with other mobile applications for memory space on digital devices; this is a major compatibility issue for young Black adults.

Young Black adult populations may be highly unlikely to adopt STD PHR utility without the support of their healthcare providers. Primary care physicians of sexually active or prospectively sexually active patients will need to explain services to patients and support patients having discussions with partners about STD risk prior to engaging in sex. This highlights the need for studies around the efficacy of PHRs as a tool that promotes healthy discussions and disease prevention.

In summary, the eSHINE Study establishes that PHRs may likely serve as a digital health tool for individuals to start conversations with partners about sexual health uninhibited by its sometimes-uncomfortable nature or other discussion barriers. PHRs create a platform for the mutual exchange of information and although this may not completely remove the awkwardness having the conversation, PHRs are believed to make it a whole lot easier. In addition, PHRs also stand to increase patient engagement in sexual health, improve knowledge on STDs, and improve the patient-doctor relationship.

Significance and Implications for Future Research

Awareness and accessibility in young Black adults is at the forefront of barriers to understanding the preventative value of PHRs and building its capacity. Putting STD PHRs in the hands young Black adults is eminent to exploring its use in risk discussion practices. We now know salient predictors of PHR utility, such as, beliefs that PHRs help to improve partner communication, limiting costs, and addressing issues surrounding utility barriers such device memory space limitations. Most importantly, adopting dyadic PHR utility depends on valuation of electronically accessing STD results.

The role of PHRs in partner risk communication requires exploration in other high-risk populations, such as MSM, sex workers, and global populations with high rates STD. Perceptions about individual and dyadic PHR utility are likely to evolve as this innovation is diffused in young Black adult populations. It will be important for future studies to understand individual and dyadic PHR utility outcomes in at-risk populations, including effects on subsequent sexual health decisions.

Future research is required on health equity in access to PHR services among young Black adults. Maximizing on the capacity of digital prevention tools through the development of tethered PHRs that are easy to use, culturally relevant, complete, free, safe, trusted, comprehensive, and supported by healthcare providers requires building a field of dyadic utility evidence based research. However, this field of research cannot develop without the proper policy and financial incentives that specifically target awareness and access to comprehensive STD PHR products among young Black adults (and other at-risk populations) at testing centers - including college campuses.

There are many unknowns about the effect that PHR accessibility will have on its utility rates, partner communication, risk behaviors, and ultimately disease prevention. It is up to

prevention researchers, testing providers, and PHR vendors to collaboratively explore these topics and provide evidenced based research that can inform the prevention sciences. Finally, future studies must also consider PHR accessibility for STD home-test kits and other STD screenings conducted outside traditional test settings.

LIST OF PUBLICATIONS AND PRODUCTS

Oral and Poster Presentations:

- Exploring Electronic Personal Health Record Services As Sexual Health Discussion Tools: A Mixed-Methods Study Among Young Black Adults (*poster*). 2016 CDC National STD Conference, Atlanta, GA (anticipated date: September, 2016).
- "Let Me See Your App!": Exploring Digital Tools for Improving Partner Communication on HIV/STI Prevention (*oral*). 2015 National HIV Prevention Conference (NHPC), Atlanta, GA (December 2015).
- PHRS and Sexual Risk Discussions in Young Black Adults (*poster)*. Minority Health & Health Disparities Grantees' Conference, National Harbor, MD (December 2014).

REFERENCES

Brown, L., Copas, A., Stephenson, J., Gilleran, G., Ross, J.D. (2008). Preferred options for receiving sexual health screening results: a population and patient survey. *Int J STD AIDS, 19* (3), 184-187.

Brugha, R., Balfe, M., Conroy, R.M., Clarke, E., Fitzgerald, M., O'Connell, E., … O'Donovan, D. (2011). Young adults' preferred options for receiving chlamydia screening test results: a cross-sectional survey of 6085 young adults. *Int J STD AIDS, 22*(11), 635-639.

Centers for Disease Control and Prevention (CDC). (2013a). Incidence, prevalence, and cost of sexually transmitted infections in the United States. Retrieved from http://www.cdc.gov/std/stats/STI-Estimates-Fact-Sheet-Feb-2013.pdf

CDC. (2011a). STD Trends in the United States, 2010: National Data for Chlamydia, Gonorrhea, and Syphilis, Atlanta: U.S. Department of Health and Human Services; 2011. Available from: : http://www.cdc.gov/std/stats10/trends.htm.

CDC. (2012) Centers for Disease Control and Prevention. *HIV Surveillance Report, 2010*; vol. 22. http://www.cdc.gov/hiv/topics/surveillance/resources/reports/. Published March 2012. Retrieved from http://www.cdc.gov/hiv/topics/surveillance/resources/reports/

CDC. (2014). *Act Against AIDS: Start Talking. Stop HIV*. Retrieved from http://www.cdc.gov/actagainstaids/campaigns/starttalking/index.html

CDC. (2015a). HIV Surveillance Report, 2014; vol. 26. http://www.cdc.gov/hiv/library/reports/surveillance/. Accessed.

CDC. (2015b). *Sexually Transmitted Disease Surveillance 2014*. Atlanta: U.S. Department of Health and Human Services.

Centers for Medicaid & Medicare Services (CMS). (2016). "April 2016 EHR Incentive Program Medicaid Incentive Payments Report". Retrieved from https://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/Downloads/April_2016_Medicaid_EHR_Incentive_Payment.pdf

CMS. (2014). "CLIA Program and HIPAA Privacy Rule; Patients' Access to Test Reports." *Federal Register*, Vol. 79, No. 25. 79 FR 7289

CMS. (2015). Medicare and Medicaid Programs; Electronic Health Record Incentive Program-Stage 3 and Modifications to Meaningful Use in 2015 Through 2017. *Federal Register, 80 FR 62761,* 62761 -62955.

Chaudoir, Stephenie R, Jeffrey D Fisher, and Jane M Simoni. (2011). "Understanding HIV Disclosure: A Review and Application of the Disclosure Processes Model." *Social Science & Medicine, 72* (10).

Cho, Hyunyi. (2012). "The Integrative Model of Behavioral Prediction as a Tool for Designing Health Messages." In *Health Communication Message Design*, 21–40. Retrieved from http://www.sagepub.com/books/Book234878?prodId=Book234878.

Glanz, K., Rimer, B. K., & Viswanath, K. (2008). *Health behavior and health education: Theory, research, and practice*, (4th ed.). San Francisco, CA: Jossey-Bass.

Goldenberg, T., McDougal, S.J., Sullivan, P.S., Stekler, J.D., Stephenson, R. (2014). Preferences for a Mobile HIV Prevention App for Men Who Have Sex With Men. *JMIR Mhealth Uhealth*, *2* (4).

Guse, Kylene, Deb Levine, Summer Martins, Andrea Lira, Jenna Gaarde, Whitney Westmorland, and Melissa Gilliam. "Interventions Using New Digital Media to Improve Adolescent Sexual Health: A Systematic Review." *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine, 51* (6), 535–543.

Health Information Technology for Economic and Clinical Health (HITECH) Act, Title XIII of Division A and Title IV of Division B of the American Recovery and Reinvestment Act of 2009 (ARRA), Pub. L. No. 111-5, 123 Stat. 226 (Feb. 17, 2009), *codified at* 42 U.S.C. §§300jj *et seq*.; §§17901 *et seq*

Kahn, J., Hilton, J., Van Nunnery, T., Leasure, S., Bryant, K., Hare, C., and Thom, D. (2012). "Personal Health Records in a Public Hospital: Experience at the HIV/AIDS Clinic at San Francisco General Hospital." *Journal of the American Medical Informatics Association: JAMIA 17* (2), 224–228.

Klassen, A., Creswell, J., Plano Clark, V., Clegg-Smith, K. and Meissner, H. (2012). "Best Practices in Mixed Methods for Quality of Life Research." *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation 21*(3) 377–380.

McInnes, K., Solomon, J., Bokhour, B., Asch, S., Ross, D., Nazi, K., and Gifford A. (2011). "Use of Electronic Personal Health Record Systems to Encourage HIV Screening: An Exploratory Study of Patient and Provider Perspectives." *BMC Research Notes 4*.

Muessig, K.E., Pike, E.C., Fowler, B., LeGrand, S., Parsons, J.T., Bull, S.S., … Hightow-Weidman, L.B. (2013). Putting prevention in their pockets: developing mobile phone-based HIV interventions for black men who have sex with men. *AIDS Patient Care STDS*, 27(4), 211-222.

Mutchler, M., Bogart, L., Elliott, M., McKay, T., Suttorp, M., and Schuster, M. (2008). "Psychosocial Correlates of Unprotected Sex without Disclosure of HIV-Positivity among African-American, Latino, and White Men Who Have Sex with Men and Women." *Archives of Sexual Behavior 37* (5), 736–747.

Office of the National Coordinator for Health Information Technology (ONC). (2016). *About ONC*. Retrieved from https://www.healthit.gov/newsroom/about-onc

Pew Research Center. (2014). African Americans and Technology Use. Retrieved from http://www.pewinternet.org/2014/01/06/detailed-demographic-tables/

Overstreet, N., Earnshaw, V., Kalichman, S., and Quinn, D. (2013). "Internalized Stigma and HIV Status Disclosure among HIV-Positive Black Men Who Have Sex with Men." *AIDS Care 25* (4), 466–471.

Sullivan, K., Voss, J., and Li., D. (2010). "Female Disclosure of HIV-Positive Serostatus to Sex Partners: A Two-City Study." *Women & Health 50* (6), 506–526.

White House Office of National AIDS Policy (ONAP). (2015). National HIV/AIDS Strategy for the United Stated: Updated to 2020. Retrieved from https://www.aids.gov/federal-resources/national-hiv-aids-strategy/nhas-update.pdf

Young, S. and Jaganath, D. (2013). "Online Social Networking for HIV Education and Prevention: A Mixed-Methods Analysis." *Sexually Transmitted Diseases, 40* (2), 162–167.